

Abstract Title Page

Title: Immediate and Longitudinal Effects of the Tennessee Voluntary Pre-Kindergarten Program on Student Cognitive and Non-Cognitive Outcomes

Authors and Affiliations:

Mark W. Lipsey
Peabody Research Institute, Vanderbilt University
mark.lipsey@vanderbilt.edu

Abstract Body

Background / Context:

Relatively few rigorous studies of the effectiveness of contemporary public prekindergarten programs have been conducted despite the growing number of programs and large monetary investments that accompany them. The study on which this presentation is based was launched in partnership with the Tennessee State Department of Education's Division of School Readiness and Early Learning to provide an assessment of the effects of the statewide Tennessee Voluntary Pre-Kindergarten (TN-VPK) program on the readiness for kindergarten of the economically disadvantaged population it serves. TN-VPK has become a controversial program in Tennessee, with some legislators expressing doubts about its value in the context of severe budget shortfalls and still others referring to it even more skeptically as expensive babysitting. This study interleaves a randomized control trial (RCT) design and an age-cutoff regression discontinuity (RD) design to evaluate the effectiveness of the TN-VPK program. Though the project is still underway, this presentation will summarize results from the RCT through first grade.

Purpose / Objective / Research Question / Focus of Study:

This study includes a randomized control experiment, but that component could only be implemented in a limited number of schools with more applicants than seats in the pre-k program. Using the RCT, this study seeks to determine the statewide effect of TN-VPK on both the kindergarten readiness of the participating children and their long-term cognitive and non-cognitive skills.

Setting:

TN-VPK supports 934 pre-k classrooms that serve more than 18,000 at-risk children across all 95 Tennessee counties, in 133 of the 136 Tennessee school systems, though all counties/systems are not represented in the sample for this paper. It is truly a statewide program serving all areas of the state, both rural and urban.

Population / Participants / Subjects:

To be eligible for TN-VPK, children must be age four on or before September 30 of the respective school year. By statutory requirement, the program gives top priority to children who qualify for the Free or Reduced Price Lunch Program, and 86% of the children enrolled statewide meet that criterion. The full randomized sample of 3,025 students in this study was 26% Black, 22% Hispanic, 50% male, and 76% Native English speakers. The consented subsample of 1,076 students was 23% Black, 18% Hispanic, 45% male, and 80% Native English speakers. There were two cohorts of children, one that applied to TN-VPK in 2009 and another that applied in 2010.

Intervention / Program / Practice:

TN-VPK operates through competitive grants to local school systems who apply for approval and funding. Those grants support only a portion of the necessary classroom funding, the balance

must come from other sources. This arrangement permits and encourages collaboration between school systems and other organizations. In this “collaboration model,” school districts may operate their pre-k programs through collaborative agreements with local nonprofit and for-profit child care providers and Head Start programs so long as those agencies have attained the highest rating from the licensing system administered by the Tennessee Department of Human Services and meet the TN-VPK standards. Those standards, which are set by the State Board of Education, require the following:

- A state licensed teacher with an early childhood education endorsement in each classroom;
- A teacher assistant who holds or is actively working toward at least a CDA or associate degree in early childhood;
- Professional development support for teachers;
- An adult-student ratio no smaller than 1:10;
- A small class size maximum of 20;
- An approved age-appropriate curriculum aligned with the Tennessee Early Childhood Education Developmental Standards;
- A family engagement component and a pre-k to kindergarten transition plan for each child;
- Vision, hearing, and health screening and referral services;
- A minimum of 5.5 hours per day, exclusive of nap time, for a minimum of 180 days per year within a calendar that includes 200 working days of 7.5 hours for teaching staff.

Research Design:

For the RCT portion of the study, in the summer before each of two school years, administrators in schools that expected more applicants to their TN-VPK program than available slots were asked to participate in the RCT. All eligible applicants were placed on a list that was randomized by the research team. Children were offered seats in the VPK program in the order that they appeared on the randomized list. This procedure gave each child an equal chance to be ranked high enough on the list to be admitted but, also, by the same equal chance, left some children too low on the list for a seat to be available for them. The total sample across both cohorts included more than 3,000 children, and those children are being tracked through the state database. Outcomes such as grade retention, disciplinary action, school attendance, and special education placement are collected from the database each year. A subsample of over 1,000 of these randomized children was individually consented and assessed at the beginning and end of their VPK year, at the end of kindergarten and first grade, and will be assessed at the end of second and third grade, as well.

Data Collection and Analysis:

Children in the consented substudy are individually assessed using a set of Woodcock Johnson III achievement tests of pre-reading, language, and mathematic skills (Letter-Word Identification, Spelling, Understanding Directions, Applied Problems, Quantitative Concepts, Passage Comprehension, and Oral Comprehension). Teacher ratings of children’s cognitive, social, and behavioral skills were also collected. All analyses were done in three-level regressions with children nested in their pre-k classrooms and districts, regardless of the timing

of the outcome variable. Propensity scores were created to reduce baseline differences between the two experimental conditions in the consented subsample, and those propensity scores as well as the variables that went into their creation were included in the analytic models testing main effects. Analytic models for non-cognitive outcomes were slightly different depending on the nature of the outcome and the sample used. At the time of this writing, RCT data are available for the both cohorts of children in the consented intensive subsample through first grade.

Findings / Results:

Though data collection is continuing in both components of this study, a large portion of outcome data for the RCT portion has been analyzed already. The results of the RCT so far indicate positive and significant effects at kindergarten entry for children who had participated in TN-VPK when compared to children who did not attend TN-VPK on all of the directly assessed achievement scales examined, with effect sizes ranging from .10 to .46. The analogous improvements for the program participants relative to the non-participants ranged from 21% to 89%. Additionally, there were statistically significant differences favoring the children who had attended TN-VPK on the kindergarten teachers' ratings of kindergarten readiness and work-related skills, obtained at the beginning of the kindergarten year. There were no differences on the other kindergarten teacher rated measures. However, differences between the treatment and control groups were greatly diminished by the end of kindergarten and were no longer significant. Similarly, group differences at the end of first grade on the directly-assessed academic measures were not significant, with one exception for which non-participants had significantly higher scores than TN-VPK participants. There were no differences on teacher rated measures at the end of first grade. Table B1 in Appendix B provides effect sizes for group differences across Woodcock Johnson subscales at each outcome timepoint.

Despite the lack of intervention effects after the pre-k year, we are beginning to see suggestions of effects on non-cognitive outcomes for program participants. In the consented subsample, TN-VPK participants were retained in kindergarten significantly less often than non-participants; 4.1% of participants were retained compared to 6.2% of nonparticipants. This effect was replicated in the portion of the full randomized sample for whom data were available; 4.0% of participants were retained in kindergarten in that sample relative to 8.0% of the nonparticipants. Additionally, in the full randomized sample, attendance in kindergarten and first grade was significantly greater for TN-VPK participants than nonparticipants by close to 2 days in kindergarten and 3.5 days in first grade.

Conclusions:

As is likely the case with other scale up state-supported prekindergarten programs, there is no consensus in Tennessee about what TN-VPK is expected to accomplish. If the expectation is that the economically disadvantaged children who attend TN-VPK will enter kindergarten better prepared, this research shows that TN-VPK fulfills that expectation. TN-VPK children gained more on early achievement measures during the pre-k year than children who did not attend and were rated as better prepared by their kindergarten teachers. If the expectation is that one year of TN-VPK will make these children perform better throughout their school careers, it is too early to tell how effective the program is. Though the early achievement measures show no sustained

differences between attenders and the control children, we do not yet know how these children will perform on the state achievement tests in third grade or the long-term effects on other aspects of school performance, early indications of which have already appeared.

Appendices

Appendix A. References

(none)

Appendix B. Tables and Figures

Table B1

The Effects of TN-VPK Participation on Woodcock Johnson Subscales across Time

Subscale	End of Pre-K		End of K		End of 1st Grade	
	Effect Size	p-value	Effect Size	p-value	Effect Size	p-value
Literacy						
Letter-Word Identification	.46**	.000	.04	.522	-.06	.399
Spelling	.25**	.000	.01	.922	-.09	.143
Language						
Oral Comprehension	.10*	.036	.09	.202	-.07	.257
Picture Vocabulary	.20**	.000	.08	.179	.02	.688
Math						
Applied Problems	.14**	.001	.02	.727	-.05	.346
Quantitative Concepts	.31**	.000	-.07	.187	-.21**	.004

* $p < .05$

** $p < .01$